

**Energy saving  
guide  
for  
agriculture  
and  
horticulture**





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# INTRODUCTION



This Guide will help you to:

- check what you are paying for your energy
- find out how your energy is being used and if it is being wasted
- achieve savings in your energy costs
- help the environment through good energy management.

Every farming and/or horticultural business uses energy, and most could use less. Experience shows that energy costs can usually be reduced by at least 10%, and often by as much as 20%, by simple actions that produce quick returns. By saving energy you are not just saving money, you are also helping the environment.

Although energy may not represent a high proportion of your company's turnover, it is a controllable cost that offers scope for reduction. Reduced energy costs feed through directly to increase profits and competitiveness. In many businesses, a 20% cut in energy costs represents the same bottom-line benefit as a 5% increase in sales. Also, many produce buyers are now demanding that farmers and growers demonstrate their 'green' credentials.

So – being energy efficient can bring added benefits to your business.

 *Burning fuel and generating electricity releases pollution and carbon dioxide (CO<sub>2</sub>) into the atmosphere. The environmental consequences include acid rain and climate change.* 



## SUMMARY

Introducing an energy efficiency scheme into a farming or horticultural business can often have unexpected results, such as:

- a general improvement in staff attitude, and in the way that things are done
- benefits that extend well beyond the immediate effects of energy saving alone, eg improved internal environment in a production facility
- improved crop quality
- compliance with crop assurance schemes
- bringing long-standing problems to the surface, where they can be addressed effectively and rectified.

In addition, your costs will be reduced, your competitiveness increased and you will be helping the environment.



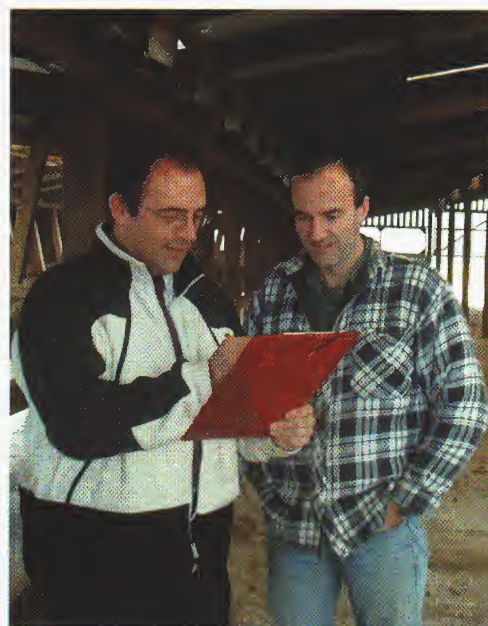
## STEP 1 – MAKE SOMEONE RESPONSIBLE

Once you have decided that you want to make energy savings, it is important that someone should be the 'energy champion' in your organisation.

Looking after energy is not a full-time job in an agricultural or horticultural business; nevertheless, the person appointed should have the support of top management and be given the necessary resources to be effective. Without clear commitment and accountability it is doubtful that there will be significant savings.

The energy champion should:

- act as the 'eyes and ears' for energy wastage
- encourage others to use energy more efficiently
- be responsible for reading fuel and electricity meters and checking fuel bills
- develop a weekly or monthly checklist of duties
- consider forming an Energy Action Team to report on progress and problems and to stimulate further action.



*“A grower manager achieved major energy savings simply through good housekeeping.”*

This Guide provides you with information and advice to enable you to achieve energy savings. If, however, you cannot spare the time, and your energy bill is sufficiently high – say greater than £10,000 a year – you may wish to call in outside help. As well as energy consultants, there are many sources of free help and information, such as:

- the Environment and Energy Helpline – 0800 585 794
- your fuel and energy supply companies
- your local Business Link.

For more information on how to contact the above, see the 'Sources of further information' section on page 19.







## STEP 2 – ESTABLISH THE FACTS

It is often said that you cannot manage something if you cannot measure it. In order to start managing your energy costs you need to:

- review your invoices for electricity, fossil fuels (gas, LPG, oil, coal, etc), field equipment fuel and transport fuels for the past year
- work out how much you are spending on each type of fuel.

With this information you can establish a baseline for energy use and determine the relative importance of the various fuels you use.

### METER READINGS

Invoices alone will not provide sufficient information for you to take full control over your energy costs. For this you need to take your own meter readings at regular and frequent intervals. This will help you to:

- identify exceptional consumption and attend to the causes quickly
- check utility invoices and ensure that you pay only for the fuel actually used
- compare current costs with previous years
- assess the seasonal pattern of consumption.

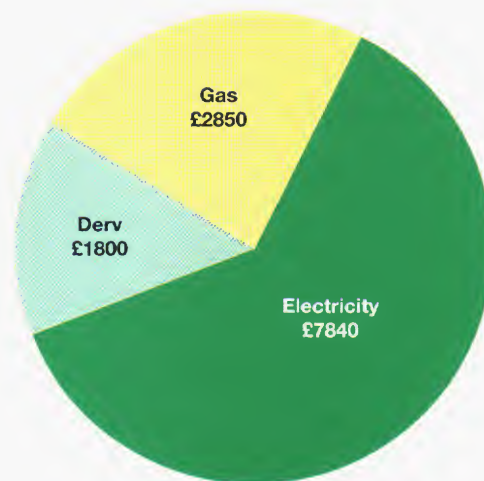
How often you take meter readings will be determined by how much energy is used. As a rule of thumb, meters should be read monthly if invoicing is quarterly, and be read weekly if invoicing is monthly.

### RECORDING AND ANALYSING FUEL CONSUMPTION

Meter readings can be recorded on worksheets or on a computer spreadsheet. In either case, consumption can then be displayed graphically, which is useful for detecting trends and giving warning of exceptional consumption. Fluctuations in energy use may have many possible explanations, including variations in workloads and throughput, weather conditions, season, etc. If these simple explanations fail, then it is worth looking further to check if some equipment malfunction or change in working practice has caused an increase in energy use.

### FUEL FOR VEHICLES

The relatively high cost of fuel for both field and road transport vehicles means that if you have a vehicle fleet a high proportion of your overall energy costs will be for diesel or petrol. Each vehicle should have a record of activity and service log. This should record date, mileometer/hours run meter reading, fuel used, task(s) carried out, driver and service/maintenance details. Information from these records can be used to analyse vehicle performance and overall costs. Use a pie chart to help you see how much you spend on each fuel type.



*Use a pie chart to help you see how much you spend on each fuel type*

### SUMMARY

At the end of this step you will have:



- a clearer picture of your energy costs
- a measure of the relative value of the different fuels you use
- an idea of the variation in consumption patterns over the year
- a better understanding of your energy use and the basic data for making improvements.

## STEP 3 – COMPARE YOUR PERFORMANCE

Once you have collected consumption data they can be used to compare:

- your performance against typical standards for similar businesses
- this year's performance with last year's
- several sites or buildings/greenhouses with each other.

Making these comparisons will help you set improvement targets and identify areas where the greatest scope for saving energy can be made. As no published UK data are currently available, the best way to assess your current performance is by making comparisons with businesses that have similar facilities to you. This can often be done through existing agricultural and horticultural trade groups and crop sector organisations.

 *You could set up a working group similar to those in the Tomato Growers' Association (TGA). This provides members with an opportunity to compare performance and energy costs.* 

### CORRECTING FOR WEATHER VARIATIONS

In some buildings (eg a greenhouse), heating can account for a large proportion of the energy bill, but consumption will vary widely with the seasons and the utilisation of the greenhouse. In other buildings, eg a broiler house, cooling and ventilation accounts for most of the energy used. Therefore, variations in the weather from one month to the next can make it difficult to make accurate comparisons between meter readings. Allowances can be made for variations in ambient weather conditions by using a method known as 'degree day' analysis. An explanation of degree-days is given in Fuel Efficiency Booklet 7 and GPG 310 (see page 19 for details).

Degree-day data for a given month are available from the relevant Energy and Environmental Management magazine. This free magazine is published by the Department of Environment, Food and Rural Affairs (DEFRA).

### CORRECTING FOR PRODUCTION LEVELS

Another key factor that affects the amount of energy used is the current level of production. For this reason it is best to relate energy consumption (and cost) to units of output. For example, a tomato grower would be advised to make any assessments based on kWh/kg, whereas an egg producer would be better to use kWh/dozen eggs.

### TRACTORS AND VEHICLES

Although data on the fuel consumption of tractors are available from a number of sources (including manufacturers and official independent testing), fuel use in practice is dependent on a wide range of factors such as matching the tractor to the job, implement set up, etc. For this reason standard data are of little use for comparing performance. The best approach is to compare the data you collect for different tractor and implement combinations carrying out similar tasks. This will help to ensure that performance is being optimised. Petrol and diesel consumption figures for cars under test conditions can be readily checked from manufacturers' handbooks or the 'new car fuel consumption booklet' from the Vehicle Certification Agency (0117 952 4191). Your records will quickly show which vehicles and (probably) which drivers are responsible for using too much fuel, enabling improvement targets to be set. This will help establish cost-effective maintenance and training programmes.

### SUMMARY

At the end of this step you will have:

- an idea of whether your fuel consumption is normal
- a way of correcting for weather variations.



## STEP 4 – PLAN AND ORGANISE

The first step in planning is the development of an energy policy statement. This should be used to raise staff awareness and demonstrate the commitment of senior management. In agricultural or horticultural businesses this may be the proprietor.

### SET OBJECTIVES AND TARGETS

A simple policy statement should set out the main objectives, together with the performance targets that need to be met to fulfil the objectives.

### DEVELOP ACTION PLANS

Once objectives and targets have been agreed, action plans can be drawn up to drive the management plan forward and set down what needs to be done from day to day. To be effective, the action plans should:

- have agreement and approval from the managers/owners
- relate actions to particular objectives
- assign actions to individuals
- describe the manpower and budget resources that have been allocated.

Formally recording the following steps will establish an energy action plan for your business:

- Write a policy statement and have it agreed by the senior manager/proprietor
- Set out objectives and targets for each part of the company
- Express objectives and targets in ways that provide real incentives for all your staff
- Draw up a detailed action plan to guide day-to-day activities
- Assign actions to individuals, with clear deadlines for reporting progress

### STAFF INVOLVEMENT

Obtaining the commitment of your staff and motivating them to use energy efficiently is crucial to achieving success. It is easy for staff to regard energy use as something the boss should worry about. It is also easy to irritate them with little notices about shutting doors and windows.

To encourage staff to participate in the campaign to save energy:

- ask them to help identify actions that need to be taken
- establish with them clear and achievable targets
- agree how responsibilities should be allocated.

If your company is large enough, competitions and incentive schemes should be considered; or at the very least a programme of events and letters of appreciation for energy-saving ideas should be circulated.

### SUMMARY

At the end of this step you will have:

- developed an energy policy with objectives and targets
- assigned responsibility for carrying out a range of actions to individual members of staff
- involved and motivated your staff.

## STEP 5 – PAY LESS FOR YOUR ENERGY

A way to reduce energy costs is to buy your fuel at the lowest price. Businesses can now negotiate directly with suppliers of all types of energy – so shop around for the best deal. When buying gas and electricity it's worth remembering that many suppliers offer discounts for prompt payment and payments by direct debit.

### ELECTRICITY

To get a competitive quote for electricity, you will need to give prospective suppliers some essential information. Your unique supply number is known as the MPAN (meter point administration number) and can be found on your electricity bill. You will also need to provide an estimate of the amount of electricity you use.

“By shopping around for electricity, a farmer saved 15% on his annual energy bill.”

### GAS

No matter how large or small your demand for gas, you can negotiate a supply contract with any supplier. If your annual consumption is less than 72,000 kWh you will be classified as a domestic or small business consumer. Above this consumption you will be classified as a business customer and you may be offered rates that are more competitive than those given to domestic/small business consumers.

For larger supplies (usually larger than 100kW demand), modern electronic metering systems are used. These record the energy use for every half hour period throughout the year. If you have this type of metering system you can get data on your electricity use from your present supplier. This is valuable information as it allows you to get a better understanding of the way electricity is used in your business. Alternative suppliers can also use the data to give you a quotation for the supply of electricity.

### USE OF CONSULTANTS

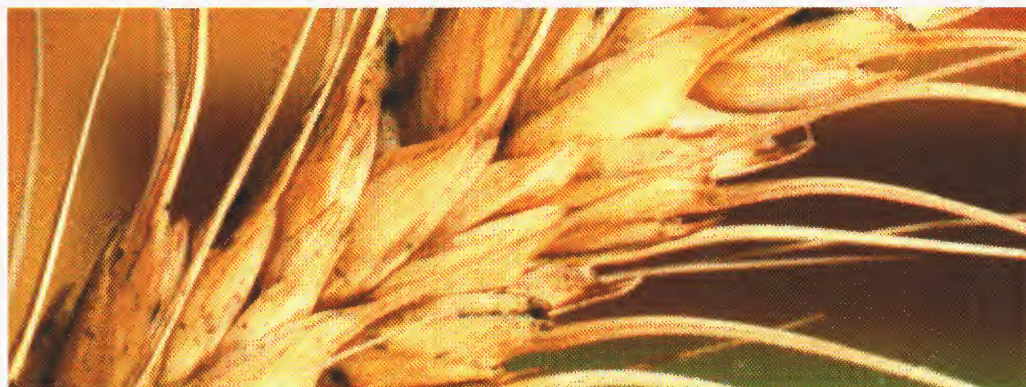
There are numerous consultants specialising in gas and electricity tariffs. If your fuel bills are high enough it may be cost effective to employ a consultant because:

- their experience should render them cost effective at obtaining competitive quotations and avoiding onerous penalty clauses
- don't underestimate the potential for savings; work only on the basis of a negotiated fixed fee for the consultant's services. Do not agree to a fee based on savings achieved.

### SUMMARY

At the end of this step you will have:

- checked that you are not paying too much for the energy you use.





## STEP 6 – USE LESS ENERGY

### AN ENERGY WALK-AROUND

A good way of starting to identify where energy is being wasted is to conduct an energy walk-around. Ask key members of staff to accompany you – both to help identify problems and opportunities, and to ensure they feel part of the assessment process.

The pattern of energy use will vary throughout the day, month and year, so it is useful to vary the times that you carry out your walk-around.

By doing an energy walk-around, a pig farmer found that by changing to compact fluorescent bulbs, he could cut energy consumption by 15%.

This will give you a wide range of opportunities to diagnose where and when problems are occurring. Pencil in some dates in your diary for walk-arounds at key times of the year, such as when the 'clocks change' and at the beginning and end of the distinct periods in the production season.

You should particularly pay attention to identifying where:

- energy is being wasted because of lack of awareness, or where procedures are being ignored
- repair or maintenance work is needed to reduce energy costs
- there is a need for capital investment to improve energy efficiency.

The following six pages use a sector-specific approach to list a wide range of opportunities for you to look out for. You can include as many or as few of these in your action plans as you choose, but the more you do, the more you will save. A more comprehensive list of measures is included in 'Focus – the manager's guide to reducing energy bills'



(see the page 19 for details). Although this publication is not specifically targeted at agricultural businesses, the general principles can be applied to good effect.

### LOW-COST CORRECTIVE ACTIONS

It is best to begin by identifying a few achievable actions and implementing them successfully. Later you can build on this success and introduce additional changes.

### MAJOR IMPROVEMENTS

You are likely to need advice from equipment suppliers, consultants or energy providers on the cost effectiveness of major improvements. They can all help you with information on new ways of drying, cooling, heating, etc, which can reduce your energy costs considerably.

Make the best use of the free advice and grants available. See page 19 for details of contacts.

### SUMMARY

At the end of this step you will have:

- found any obvious areas of energy waste that can be acted upon quickly and at low cost
- related what goes on in your buildings and facilities to what you have found out from the bills and meter readings
- gathered information to guide the energy manager's action plans.

## USE LESS ENERGY

### Protected horticulture

Heating typically accounts for 90% of the energy used in a greenhouse.

Good housekeeping and attention to detail can reap rewards – not only by minimising energy use but also through improving the environmental conditions in the greenhouse.

The effective use of climate control equipment can help to optimise energy inputs. Control parameters should be set to maximise crop response whilst reducing energy inputs.



#### Key points to look for

##### Air leakage

Reducing air leakage in a greenhouse can lower heating costs by up to 25%.  
*Regularly check for broken or slipped panes of glass and make sure that doors and ventilators close properly.*

##### Boilers and heaters

Poorly set up and maintained boilers and heaters can increase energy costs by 10%.  
*Ensure that boilers are serviced regularly and that they are set up for optimum efficiency.*

##### Heating controls

Inaccurate temperature controls lead to higher heating costs. A 1°C error in the control temperature can increase heating costs by 7.5%.  
*Clean measuring boxes and sensors regularly. Also position measuring boxes close to the crop.*

##### Pipe insulation

Ineffective or wet insulation can cost you £12.50/metre per year.  
*Check insulation and replace where it is wet or damaged.*

##### Thermal screens

Thermal screens can reduce energy consumption by 30%.  
*Fit thermal screens where possible. Polythene or bubble wrap can be used as a temporary low-cost alternative.*

##### Glass cleaning

Dirty glass reduces both the amount of light reaching the crop and the 'free' heating energy from the sun.  
*Clean glass regularly.*

##### Air circulation

Temperature gradients often occur in the greenhouse.  
*Use simple fans to redistribute hot air that collects in the roof space.*

##### Lighting

The output of lighting equipment falls with time due to depreciation of lamps and reflectors.  
*Introduce a maintenance and replacement policy which includes regular cleaning of lighting equipment and planned replacement of lamps.*



## USE LESS ENERGY

### Pigs and poultry

#### Key points to look for

<b>Insulation</b>	Buildings should be insulated with at least 75 mm of extruded polystyrene (or equivalent). <i>Check buildings regularly and replace damaged or degraded insulation.</i>
<b>Ventilation settings</b>	Over-ventilating buildings in the winter dramatically increases heating costs. <i>Use controls to make sure ventilation rates are optimised.</i>
<b>Fans and air ducts</b>	The efficiency of ventilation can be increased by 20% by using well-designed air inlets/outlets and ducts. <i>Make sure that the internal surfaces of ducts are smooth, and good air inlets are used.</i>
<b>Fan cleaning</b>	Dirty fans can reduce the efficiency of ventilation by 60%. <i>Introduce a planned cleaning schedule for both fans and ducts.</i>
<b>Air leakage</b>	Gaps in buildings, including poorly fitting doors and windows, allow heat to escape. <i>Fit draught proofing and sealant.</i>
<b>Heating and ventilation controls</b>	Heating and ventilating a building at the same time wastes energy. <i>Use interlocked controls to stop the operation of fans when the heaters are on.</i>
<b>Air re-circulation</b>	The air temperature in the ridge of a poultry building can be up to 10°C higher than on the floor. <i>Use air re-circulation fans to provide more even temperatures.</i>
<b>Creep heating controls</b>	Thermostatic heating controls on a 20-place farrowing room can save up to £725 per year. <i>Use controls to save money and give improved conditions in the farrowing room.</i>
<b>Lighting</b>	Using fluorescent or sodium lamps instead of standard tungsten light bulbs can give energy savings of at least 70%. <i>Replace tungsten lights with energy-efficient alternatives.</i>

Energy use in pig and poultry production is mainly associated with the maintenance of good environmental conditions for housed stock.

Components are primarily heating, ventilation and lighting.

Although energy accounts for an average of only 5% of total production costs, the influence it has on more significant costs like feed and mortality should not be underestimated.



## USE LESS ENERGY

### Dairy

Energy use in the dairy is split generally between one third for milk cooling, one third for water heating and one third for general use, including lighting, pumping and general power.

To save energy your efforts should concentrate on these key areas of use.



#### Key points to look for

##### Water heating

The cheapest way to provide hot water is to heat it all overnight using cheap night rate electricity.

*Use a time-switch to ensure the heater works only during chosen times. Check the hot water tank is big enough to hold all of your hot water needs for one day. The tank insulation should be at least 50 mm thick spray-foam or equivalent.*

##### Pre-cool milk

A water-to-milk plate cooler can cut the amount of energy used for milk cooling by up to 50%.

*Use a plate cooler to pre-cool milk. Ensure the water is collected and stored for reuse around the farm, as the cost of wasted water will negate energy cost savings.*

##### Refrigeration equipment

Systems should be maintained regularly. The main considerations are refrigerant levels, pressures and temperatures and the condition/cleanliness of condenser coils. *Carry out a maintenance check at least once every year.*

##### Lighting

Using fluorescent or sodium lamps instead of standard tungsten light bulbs can give energy savings of at least 70%.

*Replace tungsten lights with energy-efficient alternatives.*

##### Frost protection

Heating milking parlour and dairy buildings to stop pipes freezing during spells of cold weather wastes energy.

*Use pipe insulation, and trace heating cables to keep pipes above freezing point.*

##### Milking parlour heating

Milking parlours are difficult to heat because they are draughty and uninsulated. Space heating systems waste energy and are ineffective.

*Use high-efficiency radiant heating systems.*



## USE LESS ENERGY

### Crop storage

#### Key points to look for

<b>Store insulation</b>	<p>Insulation levels should be 0.35W/m°C or better. This is equivalent to 80 mm of Styrofoam board or sprayed urethane.</p> <p><i>Check insulation thickness and upgrade where it is inadequate or damaged.</i></p>
<b>Draught proofing</b>	<p>Check doors, louvres and air mixing boxes for sealing and leakage. Refrigeration condensate drains and other service entries can also be a source of leakage.</p> <p><i>Use sealant and draught proofing strips to close gaps.</i></p>
<b>Controls</b>	<p>Accurate controls ensure that the desired temperature is being maintained in the store.</p> <p><i>Check control sensors annually against a reference thermometer.</i></p>
<b>Refrigeration system maintenance</b>	<p>Systems should be maintained regularly. The main considerations are refrigerant levels, pressures and temperatures and the condition/cleanliness of condenser coils.</p> <p><i>Carry out a maintenance check at least once every year.</i></p>
<b>Lighting</b>	<p>Using fluorescent or sodium lamps instead of standard GLS light bulbs or tungsten lamps can give energy savings of at least 70%.</p> <p><i>Replace tungsten lights with energy-efficient alternatives such as high-pressure sodium or fluorescent.</i></p>
<b>Store management</b>	<p>Stores should be loaded/unloaded in such a way that good airflow is achieved around and through the crop. Frequent traffic in and out of the store can significantly increase energy use due to warm air ingress through open doors.</p> <p><i>Load stores to achieve design airflow. Use strip curtains or automatic doors to reduce heat gain through open doors.</i></p>
<b>Ambient cooling</b>	<p>Using ambient air cooling is more energy efficient than using refrigeration, although the same performance cannot be achieved all year round.</p> <p><i>Use mixed ambient/refrigerated cooling systems to optimise energy efficiency whilst maintaining the required cooling performance.</i></p>

Energy use in crop stores is closely related to insulation thickness and the differential between ambient temperature and storage temperature.

Air leakage is also a significant contributor to heat gain.



# USE LESS ENERGY

## Combinable crops

Storage and drying of combinable crops can be a large area of energy waste. Ensuring that facilities are in good condition is key to ensuring that crops can be kept in good condition whilst costs are kept under control.

Remember to prepare your drying and storage facilities adequately before harvest – just because they worked well last year doesn't mean that this year will be the same.



### Key points to look for

<b>Fans</b>	<p>As the prime mover of any drying and cooling system, it is essential that the fan is in good working order and well maintained.</p> <p><i>Check for corrosion and damage, clean the blades thoroughly and have the fan performance tested to check that it reaches the specified speed, output, etc.</i></p>
<b>Air inlet and exhaust vents</b>	<p>Inadequate or badly designed and constructed air inlets and outlets can restrict airflow in and out of the dryer.</p> <p><i>Check that the inlet and exhaust vents are of a suitable size, and clear any obstructions to airflow.</i></p>
<b>Heaters</b>	<p>Inoperable or inadequate heaters or dehumidifiers can prolong drying times and increase costs.</p> <p><i>Put a maintenance plan in place to make sure that heaters operate to optimum efficiency.</i></p>
<b>Controls</b>	<p>Efficient operation of dryers can be achieved by using automatic humidity control of fans and heaters.</p> <p><i>Use humidity-based controls and check the calibration of sensors at least annually.</i></p>
<b>Air ducts</b>	<p>A leaky main air duct can lead to air loss of at least 10%. This inevitably leads to slower drying.</p> <p><i>Inspect ducts and repair as necessary.</i></p>
<b>Ventilated floors and laterals</b>	<p>Floors and lateral ducts are frequently damaged during store emptying. Perforations are also susceptible to blockage from broken grains, soil, etc.</p> <p><i>Clean and repair lateral ducts and floors to avoid uneven airflow and excessive back pressure.</i></p>
<b>Operating strategy</b>	<p>The efficiency of a dryer is highest during periods of warm weather.</p> <p><i>Drive the dryer hard during the harvest period to aim to finish as soon as possible after the completion of cutting.</i></p>
<b>Store loading</b>	<p>Irregular loading patterns lead to poor airflows and uneven drying.</p> <p><i>Load the store level to ensure efficient drying and controlled costs.</i></p>
<b>Lighting</b>	<p>Use discharge lighting such as high-pressure sodium for store illumination.</p> <p><i>To comply with crop assurance schemes all lamps should be equipped with shatterproof covers.</i></p>





**USE LESS ENERGY**

## Tractors and vehicles

### Key points to look for

#### Regular checks

*Carry out regular checks of tyre pressures, lubricant levels, etc to ensure tractors and vehicles continue to operate in tiptop condition.*

#### Maintenance

Regular servicing will save money and reduce exhaust emissions.  
*Set up a schedule for servicing all tractors and road vehicles.*

#### Driver training

Poor driving technique has been shown to increase fuel consumption by 20%.  
*Set up a driver training programme so staff understand how to drive tractors and machines effectively.*

#### Machine allocation

Allocating machines to the most appropriate task is the best way of achieving efficient fuel use.  
*Draw up a schedule of tasks listing the most appropriate tractor and equipment combinations.*

#### Tractor set-up

Ballast levels and the correct tyre pressures ensure that draught operations are carried out effectively. Ballast should be removed and tyre pressures readjusted when the tractor is not being used for draught work.  
*Draw up a schedule of ballast and tyre pressures for tractor and draught implement combinations.*

Fuel performance can be improved by adopting simple measures including monitoring and analysing fuel usage figures.

With tractors and field vehicles, allocation of machines to the most appropriate task and machine setup are both key to efficient operation.

With road vehicles, a drop in tyre pressure of 2 PSI increases fuel consumption by 3% and a 1° misalignment in the steering increases tyre wear and the fuel consumption by a further 4%.





## STEP 7. CONTROL AND MONITOR

The preceding pages have set out the main components needed to manage energy use in your business. To be effective, energy management is not just a one-off drive; it should be a process of continuous control and improvement. You must therefore set up recording and monitoring systems that check that targets are being met and identify further economically viable cost reduction opportunities.

Use the meter readings and other energy use data to monitor progress, compare results with your own

targets and performance indicators. Make sure you also produce a checklist to ensure that the faults you have put right do not recur.

Lastly, consider ways in which to make energy management the basis of a wider programme of environmental management. The box below lists schemes that help businesses to improve their environmental performance.

### GREEN BUSINESS IS GOOD FOR BUSINESS

Now you have looked at energy, why not look at all the other ways that your business affects the environment? Environmental management is about companies adapting to changing conditions through positive management, innovation and improved production methods. Benefits include increased sales, access to new markets and direct cost savings through waste reduction and improved process efficiency.

#### **CROP ASSURANCE SCHEMES AND PROTOCOLS**

Crop assurance schemes like the Assured Produce Scheme and Assured Combinable Crops Scheme all give companies the opportunity to gain a competitive advantage from the recognition of their commitment to work towards the continuous improvement of environmental performance. For larger agricultural and horticultural companies, there are initiatives such as the Eco-Management and Audit Scheme.

#### **ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS)**

An effective EMS, such as ISO14001 and EMAS can deliver significant environmental

improvements through effective management and increased efficiency. The usual benefits of an EMS are reduced waste, reduced costs and reduced environmental impact.

#### **ENVIRONMENT AND ENERGY HELPLINE (0800 585794)**

This provides free information and advice to businesses on all energy efficiency and environmental issues. Companies, through the Action Energy programme, may qualify for a free consultant's visit.

#### **ENVIROWISE**

The programme promotes better environmental performance that reduces business costs for UK business. Guides and Case Studies show how environmental improvements can be achieved at the same time as cutting costs.

The programme concentrates on waste minimisation and cost-effective cleaner technology. Information on industry sectors and technologies is available. Access to the programme is through the Environment and Energy Helpline.